FC1049 - Bachelor's Degree Final Project 2015/2016

UNIVERSITAT JAUME·I

CURRENCY WARS

Bachelor's Degree in Finance and Accounting

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1. Abstract

A currency war (also known as the competitive depreciation or a policy of impoverish the neighbor) occurs when a country wants to obtain a competitive advantage which improve its trade balancethrough a series of changes in its currency. With these currency movements exports become cheaper for foreigners while imports become more expensive for residents in the own nation. These advantages produce strong discussions between different commercial partners.

The goal of this project is to analyze in depth which economic variables affect and are affected bythe depreciation of the currency of a country and if this coincides to what economic theory predicts.USA, China, Germany, Brazil, Switzerland and Greece are involved in this battle, but not all affected equally. As we will see then, while some are taking profits, others are losing. We are facing a zero-sum game.

Key words: Devaluation, Exchange Rate, Exports, Monetary Policy, Central Bank, Quantitative Easing.

Resumen.

Una guerra de divisas (también conocida como la depreciación competitiva o una política de empobrecer al vecino) se produce cuando un país a través de una serie de modificaciones en su moneda consigue obtener una ventaja competitiva en la cual mejorará su balanza comercial. Las exportaciones se vuelven más baratas para los extranjeros mientras que las importaciones se encarecen para los residentes propios de la nación. Esta ventaja comercial crea fuertes discusiones entre los distintos socios comerciales. El objetivo de este proyecto es analizar en profundidad a qué variables económicas afectan yse ven afectadas por la depreciaciónde la moneda de un país y si realmente se espera que ocurra lo que la teoría económica predice. EEUU, China, Alemania, Brasil, Suiza y Grecia creemos son participes en estas batallas, pero no a todos afecta por igual. Como veremos a continuación lo que a unos beneficia a los otros perjudica, es decir estamos ante un juego de suma cero.

Palabras clave: Devaluación, Tipo de Cambio, Exportaciones, Políticas Monetarias, Banco Central, Flexibilización cuantitativa.

2. Introduction

In a perfect world everyone would work in the job we excel at and then we would exchange goods and services with another person in order to get all the things that we need to live. . The problem is that the simple exchange of goods and services is not so easy. That is why we use money. Money is a way to measure the value of the products and services we need. Up to this point everything is fine if you only want to buy and sell products and services in the same country.But if we want to trade (export-import) with other countries that use a different currency we need to use our currency to buy foreign currencies. All these currency conversions are made on the Foreing Exchange Market (FOREX Market).

The problem is that some currencies are stronger than others, meaning that buying things in another country can cost you cheaper or more expensive than buying them at home. For example, if we are the country A and want to buy in country B we will change our money for country's B money, so if the currency of country B is weak we can get more money in the foreign country than we initially had.

In the past there was a competition for a strong currency because it gave greater prestige and reflected the stronghold of a country. But, over the years, we have concluded that there is no greater strength than being a creditor instead of a debtor. For this to be true, it is necessary that exports are greater than imports, in the other words, have a positive balance of payments. In order to sell more products and services outside, the country try to weaken its currency because it makes their products cheaper for people from other countries.

But, what about countries that have not depreciated its currency? Products are more expensive so, sooner or later they will have to cut back on costs, for instance in the wages of workers.

It is known as a currency war a succession of drastic monetary policies to depreciate the value of the currency with the aim of maintain exchange rates as low as possible in order to favor exports. These actions lead to good prices in the global market compared to its competition that have a stronger currency and therefore higher prices. A weak currency also benefits a domestic production because is more expensive to import and this works as a protection for farmers and local industry.

But it also has some disadvantages such as an increase in oil prices, the loss of purchasing power of citizens or the risk of speculative bubbles because the flow of money encourages the investment in riskier projects.

The current currency battle is between the US dollar, the Chinese Yuan and the euro. Other main actors are the Japanese yen, the British pound and the Swiss franc. And also are included emerging market currencies such as the Brazilian real and the Russian ruble.

The goal of this project is to analyze in depth what is known as a currency war. First we will discuss the effects of a currency appreciation or depreciation, that is to say, which economic variables are affected by this. Then we explain the 3 possible methods for currency depreciation. After that, we will perform an in-depth analysis of a number of countries we suspect to have intervened in the past or are involved today in this war. Is it really effective this competitive devaluation? Is there any correlation according to what is expected in economic theory? How ethical is to get rich impoverishing your neighbor? All these questions are those that will try to answer in this project.

3. Factors that can affect the appreciation or depreciation of currency.

It is said that having a strong currency is synonymous of a prestigious currency but, if we want to increase our exports we would rather have a weak currency in order to compete with other countries. This is one of many dilemmas existing when answering the question: deprecating the currency yes or not? The first section of this thesis will focus on explaining which economic and financial variables affect (and are affected by) the appreciation or depreciation of a currency.

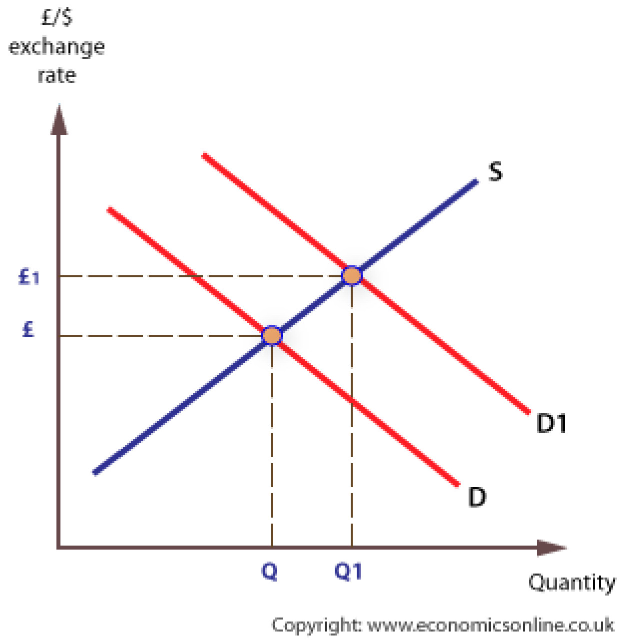
3.1 Supply and Demand.

A currency is demanded in the currency market by foreigners who want to buy goods, services and assets of our country and in turn is offered by domestic residents who need foreign currency (foreign exchange) to purchase goods, services and foreign Assets.

Appreciation:

If, for example, there is an increase in the number of American tourists who decide to spend their holidays in England, they will want to change Dollar for Pound in the foreign exchange market, so there will be anincreased demand for Pound.The consequence is that the Pound will appreciate (see Figure 2.1). The figure shows an increase in the demand of Pound transferred to the demand curve by increasing the number of Pounds and increasing the exchange rate.

Figure 2.1 Rightward shifts in demand curve

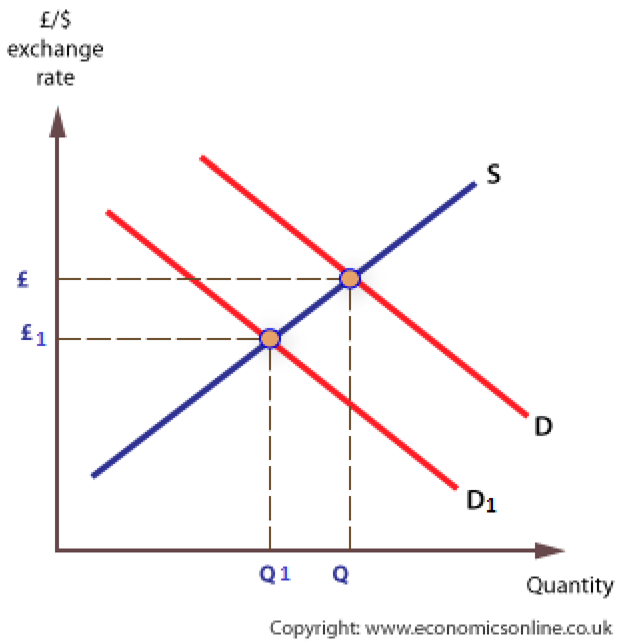


This figure represents an aggregated supply-demand model for the exchange rate between the Sterling Pound and the Dollar when the demand for Sterling Pounds increases.

Depreciation:

On the other hand, if there is an increase on the number of Englishtourists choosing to holiday in EEUU, they will want to change Pound for Dollar in the Forex Market. The consequence is that the Pound depreciates (Figure 2.2). The figure shows a decrease in the demand of Pounds transferred to the demand curve by decreasing the number of Pounds and decreasing the exchange rate.

Figure 2.2 Leftward shifts in demand curve



This figure represents an aggregated supply-demand model for the exchange rate between the Sterling Pound and the Dollar when the demand for Sterling Pounds decreases.

In the aggregated supply-demand model depicted in figures 1 and 2 we talked about two main economic forces: supply and demand. In this economic model the equation *Aggregated Supply = Aggregated Demand* holds.

Supply is the measure of how much a particular commodity is available at any point of time. The value of a commodity–a currency in this case–is directly linked to its supply. As the supply of a currency increases, the currency becomes less valuable. Conversely, as the supply of a currency decreases, the currency becomes more valuable.

Think about rocks and diamonds. Rocks aren't very valuable because they are everywhere. You can take a walk down a country road and have your choice of hundreds or even thousands of different rocks. Diamonds, on the other hand, are expensive because there are not many of them in circulation. There is a small supply of diamonds in the world, and you have to pay a premium if you want one.(S. Wade Hansen, Investools, 2006)

On the other side of the economic equation, we find demand. Demand is the measure of how much of a particular commodity people want at any one time. Demand for a currency has the opposite effect on the value of a currency than does supply. As the demand for a currency increases, the currency becomes more valuable. Conversely, as the demand for a currency decreases, the currency becomes less valuable.

To get a good idea of the effects demand can have on something’s value, you have to look no further than Apple Watch. When Apple watch was first released, there was an insanely high demand for the clock. Everybody were trampling each other to pay for it. For those who were not fast or aggressive enough to get an Apple watch at the store, paying outrageously high prices on eBay was their last resort. Huge demand had made this electronic watch was much more valuable than it would have been if nobody wanted it.

When there is more money circulating in an economy, there is more supply than demand. And this depreciates the value of the currency. There are several methods to create more money because in this currency war this what is exactly looked for: to make the value of the currency fall. We will discuss the methods in point 3.

3.2 Inflation and Deflation.

Inflation occurs when the general prices of goods and services in a country increase. If inflation rises in one country but not in the other, exports decrease, resulting in lower demand for the currency. In contrast, imports will be higher, as it will be cheaper to buy in other countries than their own. As we have to buy to offer the national currency, we need to lower its exchange rate in relation to other foreign exchange rate to meet demand.

Deflation occurs when the general prices of goods and services go down. Deflation increases the purchasing power of money and causes its value to appreciate. During times of deflation, businesses must continually decrease the prices of their goods and services to find buyers. This results in the business's earning less revenue, making it necessary to reduce output to cut production costs. A reduction in output then leads to job lay-offs and can eventually cause business and plant closures. This results in massive unemployment and a further weakening of the economy.(Carty, 2016)

3.3 Economic Outlook.

In general, a strong economy will raise confidence, assuring foreign investors that they will earn a good profit on a stable investment. Economic growth is even better, attracting investors who hope that their investment will grow, too. A boom in the economy can cause an investment rush that results in a temporary overvalue of the market. If a country's economy is in a strong growth period, the value of their currency appreciates. Appreciation also occurs when major economic indicators like Gross Domestic Product and retail sales are on the rise.

What goes up must come down. A slowing economy hurts the currency, causing investors to pull out for fear that their investment will lose value. If a country's economy is in a slow growth or recessionary phase, the value of their currency depreciates. The value of a country's currency also depreciates if its major economic indicators like retail sales and Gross Domestic Product, or GDP, are declining. A high and/or rising unemployment rate can also depreciate currency value because it indicates an economic slowdown. (CurrencyTrading.net, 2007)

3.4 Balance Trade.

The balance of trade influences currency exchange rates through its effect on the supply and demand for foreign exchange. When a country's trade account does not net to zero (when exports are not equal to imports) there is relatively more supply or demand for a country's currency, which influences the price of that currency on the world market.(Investopedia, 2015)

If a country exports more than it imports, there is a high demand for its goods and thus for its currency. Supply and demand dictate that when demand is high, prices rise and thus the currency appreciates in value. .A deficit in the current account shows the country is spending more on foreign trade than it is earning.

On the other hand, if a country imports more than it exports, there is relatively less demand for its currency, so prices should decline. In this case, a currencydepreciatesor loses value.

4 How do countries depreciate their currency?

As we have seen in the previous section the increase or the decrease of the price of the local currency produces some effects in the country economic situation both internally and externally. Some of these effects can have harmful consequences for the well-being of the citizens of that country. However, a state's Central Bank can still intervene in the markets and effectuate a currency depreciation through monetary policies. In many cases, the main goal is to stimulate the economy through an increase of the competitiveness at international level by making the local currency "cheaper" than the rest. Let us see now three methods to carry out this depreciation.

4.1 Buying government bonds or public debt.

Government debt (also known as public debt, national debt and sovereign debt) comprises all government liabilities, including future pension payments and payments for goods and services the government has contracted but not yet paid(Wikipedia, 2016). Debt is an instrument of monetary and fiscal policy of States. With the purchase of government bonds, a State may increase or reduce the amount of money in circulation, with also increase the supply in the currency market and make the value of thisfall.

4.2 Reducing interest rates.

Lower interest rates is a priori good news for mortgage holders. Those mortgages that are referenced by the Euribor(over 80% of mortgages in Spain) are likely to enjoy a reduction in their mortgage payments because of the direct relationship between the evolution of interest rates and Euribor.
However, it all depends on the conditions agreed with the bank when signing the mortgage, the revision date, etc. We must also take into account that many old mortgages have the clause floor, so they could not see a reduction in their monthly pay.
Anyway, if cut prices on mortgages, families could have a little money bonus every month that projected for consumption or other destinations. Accordingly, if families have more money and increase consumption, companies sell more.
Another effect of lower interest rates is that citizens and businesses could be financed cheaper. If interest rates fall would mean an automatic reduction in the rate at which

the Central Banks lends money to the banking system. Therefore, credits in general should become cheaper and offer lower interest rates to their claimants.

If companies are financed cheaper, can allocate more capital at investments and maintaining employment.

The main negative effect is lower returns on savings products. The profitability of bank deposits decline, so it would be a flow of capital from savers to equities in order to achieve greater profitability.(BBVA, 2015)

4.3 Quantitative Easing

Quantitative Easing is a tool of unconventional monetary policy used by some banks to Increase Central money supply. Ultimately this is an economic stimulus program. It is aimed to provide the System with liquidity, increasing the amount of money in circulation in the market. For this, the Central Bank buys bonds, usually bonds for companies, banks and institutions available

The idea is that the extra money will help banks to restore their balance sheets, and thus it will start a flow from these to other areas of the economy where it is needed, which increases spending and investment.

Through quantitative easing, it is the central bank which buys government bonds (or other private debt) in the hands of private banks. And how are they buying? Printing new banknotes. Quantitative Easing have various effects:

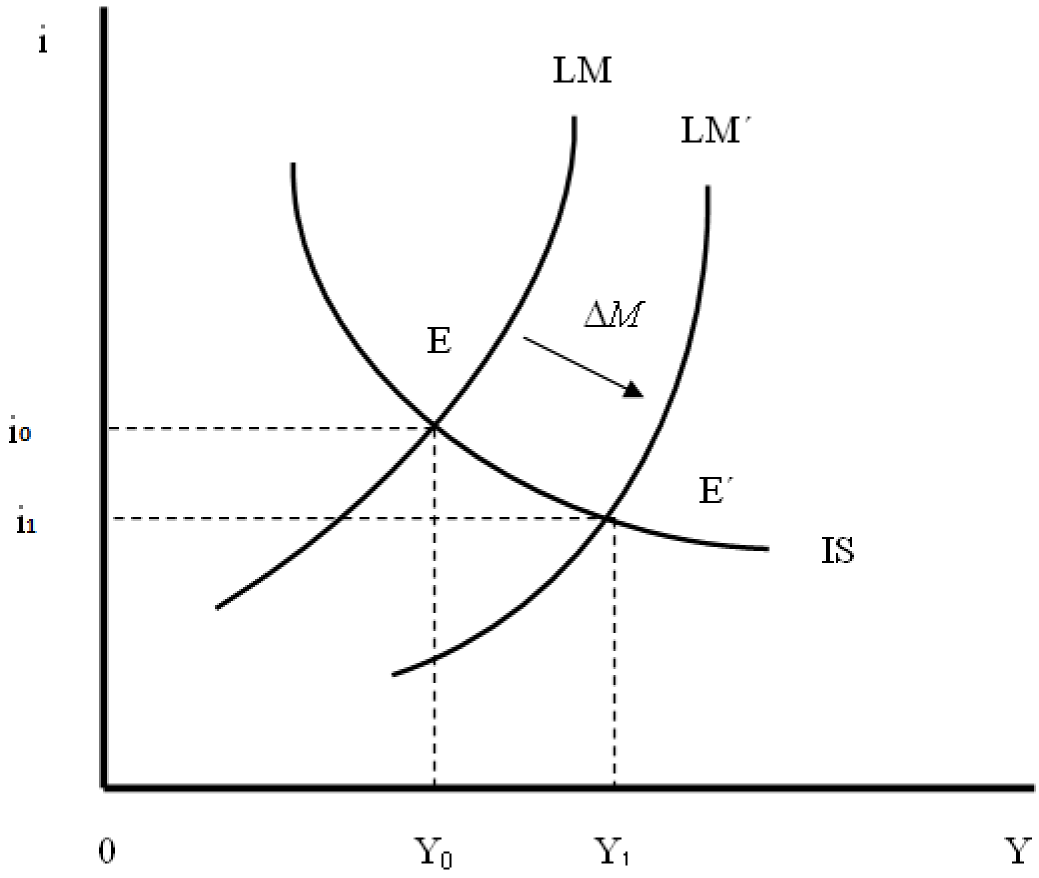
1. Help to reduce interest rates: if the central bank increases the demand for certain debt securities, the interest rate of these debt securities falls.
2. The financial situation of private banks improves: their investments are not so "stuck" or "committed" in long-term loans, but are replaced with cash freshly printed by the central bank. Banks do not have excuse to lend money.
3. The combination of lower interest rates and liquidity hosing banks should increase new lending to the productive economy.On the one hand, the bank balance sheet is stronger after quantitative easing and therefore has greater capacity to extend new credit. On the other hand, low interest rates provide an incentive for banks to look for new investors. That is to say, banks will have no alternative to take greater risks and lend families and companies the new money they have received from the central bank.

4. The increase in credit to the private sector will increase consumption and investment based on debt. This will tend to revitalise the economy and, in this way, prices will increase and it is possible to exit from deflation.
5. Part of that spending on credit will leak to the outside and to this end, have to sell currency and buy foreign currency. This will lead to an Increase of the demand for the other currencies which will make depreciates itself.
6. The agents will feel comfortable tobe back into debt again, to invest, to consume, to export and to hire more workers.

On the other hand, QE also brings adverse effects on the economy. First, the central bank loses leeway in managing its currency.Second, low interest rates do not have to stimulate a new cycle of debt, consolidate an economic context of high debt and overvalued assets when the objective of this is to lessen our debt and allocate capital to truly more valuable projects. That is, lowering interest rates make easier families and businesses to borrow but you cannot force it.Third, more debt, more risk. This can lead to crises that we know and what we try not to fall into the same mistake.(Rallo, 2015)

Quantitative easing is an unconventional method that central banks have used as a tool to overcome the crisis but that can be explained with the old conventional models Keynes, Hicks or Tobin and thus understand the macroeconomic questions that arise. (Mendoza, 2015)

Figure 3.1 IS-LM MonetaryPolicy



This figure represents an aggregated supply-demand model with the total output in the horizontal axis and the interest rate in the vertical axis. In this figure it is represented a rightward shift in the aggregated supply as a consequence of a QE stimulous program.

When the Central Bank decides to make a monetary expansion that is raises the nominal amount of money. This measure does not affect the components of the IS curve (or the supply or demand for goods) therefore it will remain in its original position without being altered. However, the increase in the money supply would cause a decline in the interest rate, and in turn will increase the demand for property investment (and probably consumer goods) and this will cause a shift to the right of the curve LM. Product markets (curve IS) and money (LM curve) are perfectly interrelated are interdependent: what happens in the money market, affects the product market; and what happens in the product market, affects the money market.

5. Analysis

In the previous two points we have discussed factors that allow us to play a little with the currency of our country as well as 3 possible methods to do so. Once we have seen that the devaluation of the currency affects several economic variables we will test or rather we will study in depth a number of countries we suspect they have acted in what is known as a currency war. We are going to see whether the underlying economic theory works or not when explaining these situations of currency wars.

In order to start, we need to place ourselves in time chronologically.

In 2008 the USA suffered its biggest financial crisis since the 30s as a result of speculative lending and whose trigger was the bursting of the housing bubble with known junk mortgages (“subprime"). This crisis affects the whole world.

In 2009 the Greek government recognizes that the country's deficit was much higher than previously admitted and interest on its bonds is triggered. The European Union and the IMF are negotiating an aid program to prevent spread of the crisis to other economies such as Portugal, Spain, Ireland and Italy.

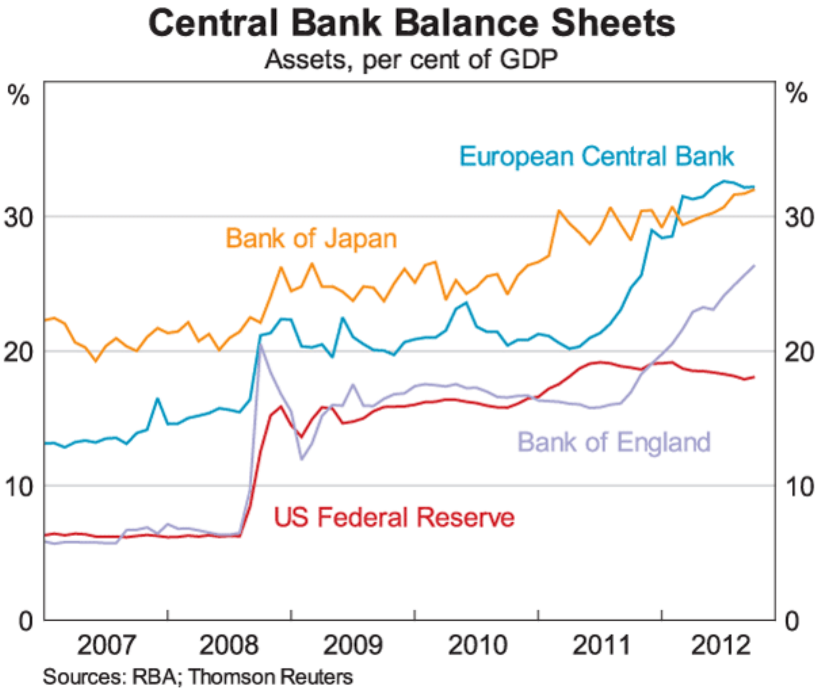
It is from 2010 on that countries begin to use their currencies in order to accelerate the end of their crisis. The finance minister of Brazil, Guido Mantega, announced that the world was "in the middle of a currency war”. The Federal Reserve of the United States of America, the European Central Bank, the Bank of Japan and the Bank of England also initiated an expansionary monetary policy to stimulate recovering by:

- The credit easing, which involves expanding the funding schemes of commercial banks. This flexibility not necessarily mean changing the amount of money in circulation by the Central Bank if the latter releases simultaneously other assets in your balance to compensate for the volume of loans granted under these more flexible conditions.

- An increase in the size of their balance sheets through direct asset purchases (quantitative easing)

• Facing forward: the central bank agrees to make a series of expansionary policies for a relatively long period of time that may or may not refer to employment or inflation.
All this makes the size of their balance sheets increase significantly (Figure 4.1). (The ECB began at a later stage compare to the others)

Figure 3.1 Central Bank Balance Sheets



This figure represents the value of the assets of the Central Banks of the European Union (blue line), Japan (orange line), United Kingdom (light blue line) and US (red line) as a percentage of the corresponding country (union) GDP.

But not everyone acted in the same way; there was an important difference between the measures taken by the Federal Reserve and the European Central Bank to increase their balance sheets.

The Fed bought government bonds primarily USA Treasury and mortgage-backed securities. While the ECB increased its balance mainly as a result of refinancing operations provided long-term liquidity to commercial banks. They allocated about 1,000 million Euros to banks in the euro zone. The reduction in the ECB balance was observed in 2013 and it was due to the early cancellation by the more stable European banks on loans obtained since such loans became less attractive.

Therefore, while the Fed injected directly and durably liquidity in the public and private markets (especially mortgage markets) through the direct purchase of assets, the ECB instead injected abundant liquidity temporary provision in banks euro zone.

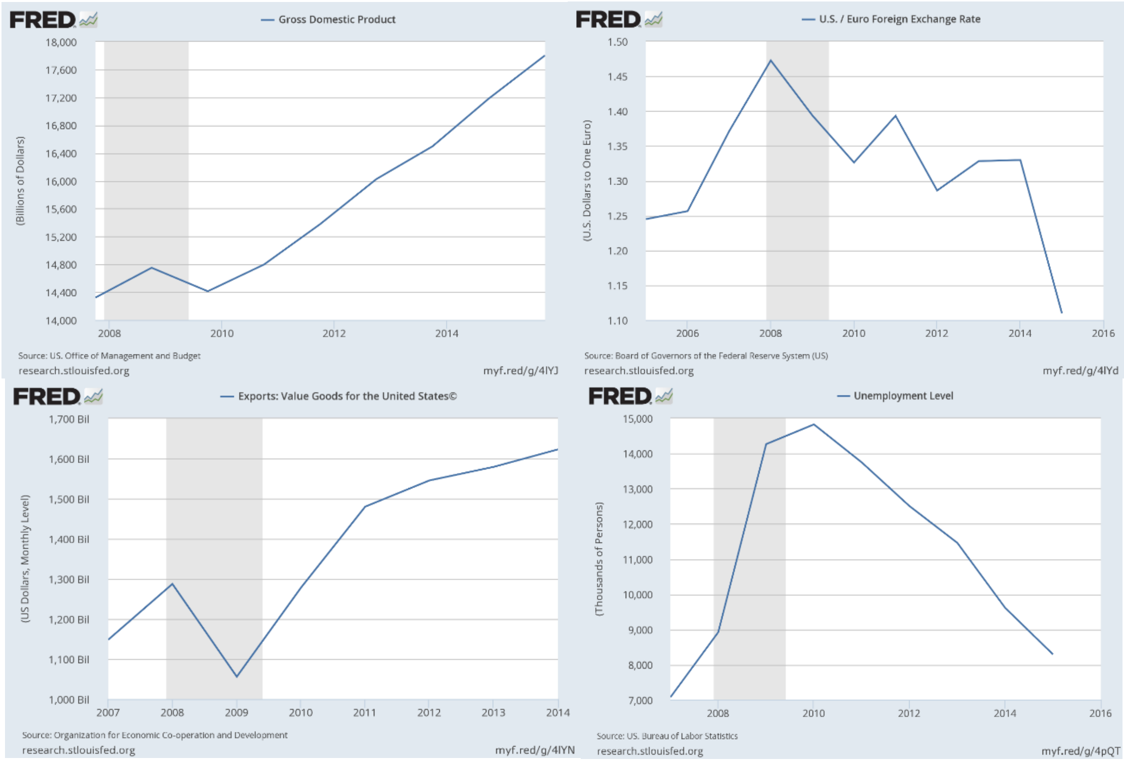
After that, we will focus on a number of countries that have intervened in this suspect currency war.
Most of the data we used were extracted from the Federal Reserve Bank of St. Louis (see Appendix). All figures represents data non-seasonally adjusted, at annual frequency and chosen from 2007 to 2015.

5.1 UnitedStates

After the fall of Lehman Brothers and the confirmation of one of the worst crises in the history of capitalism, the US central bank low interest rates to near zero to try to activate the economy. This was not enough and the stimulus plan became to massive purchases of financial assets and mortgage loans for flooding with liquidity the markets. The GDP grew by 4% year by year (Figure 4.2 top-left), the dollar lost value (Figure 4.2 top-right) which exports[1] pushing (Figure 4.2 bottom-left) and alsoa considerable weight of the domestic market. In addition, this helped to reduce debt with the rest of the world because this was in large part in dollars and countries like China were affected by a decrease in the value of their reserves. There were more than 3 years doing this process which caused the flow of investment into other markets with higher interest rates and higher profitability promises. The main destination of the investment were emerging countries such as Brazil that we can see below. In June 2013, the Fed announced its intention to end its purchases of debt. It was the starting point to prepare the way back to the United States. Since the beginning of 2014, the recovery of the US economy was a reality, once ended the program of monthly injections of dollars. From 2015 the Fed announced a rise in interest rates. It is now that emerging countries confront the withdrawal of money which had favored them for several years.

[1]The exports had reached 1.600 billion dollars.

Figure 4.2 Evolution of macro variables in the US



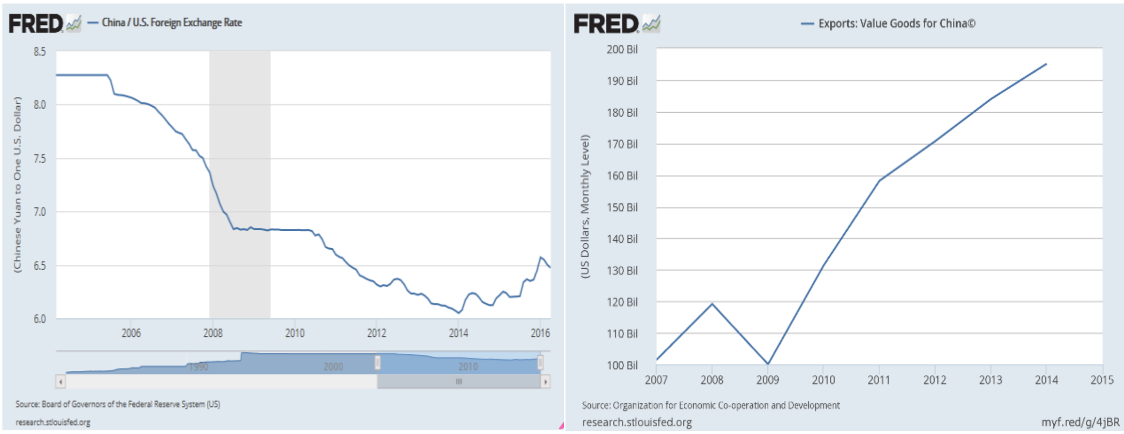
This figure displays the evolution of several economic indicators in the US. The top-left plot represents the total GDP (in millions of Dollars) during the period 2007-2014. The top-right plot shows the US/Euro exchange rate evolution (i.e. how many dollars can be bought with 1 euro). The plot at the bottom-left of the figure displays the total exports of the US (expressed as the total value of goods in US Dollars).Finally, the plot at the bottom-right presents the evolution of the number of unemployed people in the US. Shaded areas mean a recessionary period

There are an inverse relation between GDP growth and changes in the unemployment rate. The economic theory predicts a negative relationship between GDP and unemployment (Figure 4.2 bottom-right): if it GDP grows, unemployment decrease.

5.2 China

One of the developing countries of Asia is the People's Republic of China. Its currency the Yuan is the basic unit of the renminbi, the name by which it is also known. An important part of the Chinese economy is based on exports.Therefore China isnot interested in the situations where the dollar loses value because their exports would be reduced and would have to increase domestic consumption and save less. For this reason, China is keeping the Yuan at a low level at the same time that buying American debt for the dollar not low the value.

Figure 3.3 Evolution of macro variables in China



This figure displays the evolution of several economic indicators in China during the period 2007-2014. The top-left plot shows the China/US exchange rate evolution (i.e. how many Yuan can be bought with one dollar).The shaded area in this plot means a recessionary period. The top-right plot in the figure displays the total value of exports in China (expressed as the total value of goods in US Dollars.

In this chart (Figure 4.3 top-left) the exchange rate of the Yuan against the dollar is observed. From 2000 to 2005 the Yuan remains constant against the dollar. From 2005 on it began to fall the Chinese currency due to the Schumer-Graham bill proposed by the US Congress, which was to increase duty by 27.5% on all Chinese products from entering the United States so to be produced a revaluation of the Yuan. In the end this law was not carried out because China changed its exchange rate policy, decided to reestablish the fixed parity keeping the level of about 6.85 to early 2010. From this date the Chinese government reinstated the semi-floating mechanism, allowing the Yuan reaching a low record at 6.04.

If we compare the previous graph (Figure 4.3 top-left) to the next (Figure 4.3 top-right), we see what we have explained in theory. There is a high degree of correlation between the exchange rate and exports. In 2009 these fell by almost 17% due to the global financial crisis but from 2010 exports grew by 31% over the previous year and have not stopped growing gradually since.

It is from 2015 on when China lost competitiveness against other major countries (Japan and Germany) where the currency had been devalued drastically due to quantitative easing operations. In August of that same year China devalued the Yuan almost 3% due to low number exports.

Foreign sales represent 22.7% of GDP. China is living with a surplus in its trade balance, as imports (in spite of growing) are lower than exports. The coverage rate (percentage of what is imported that can be paid with what is exported) was 119.51%.

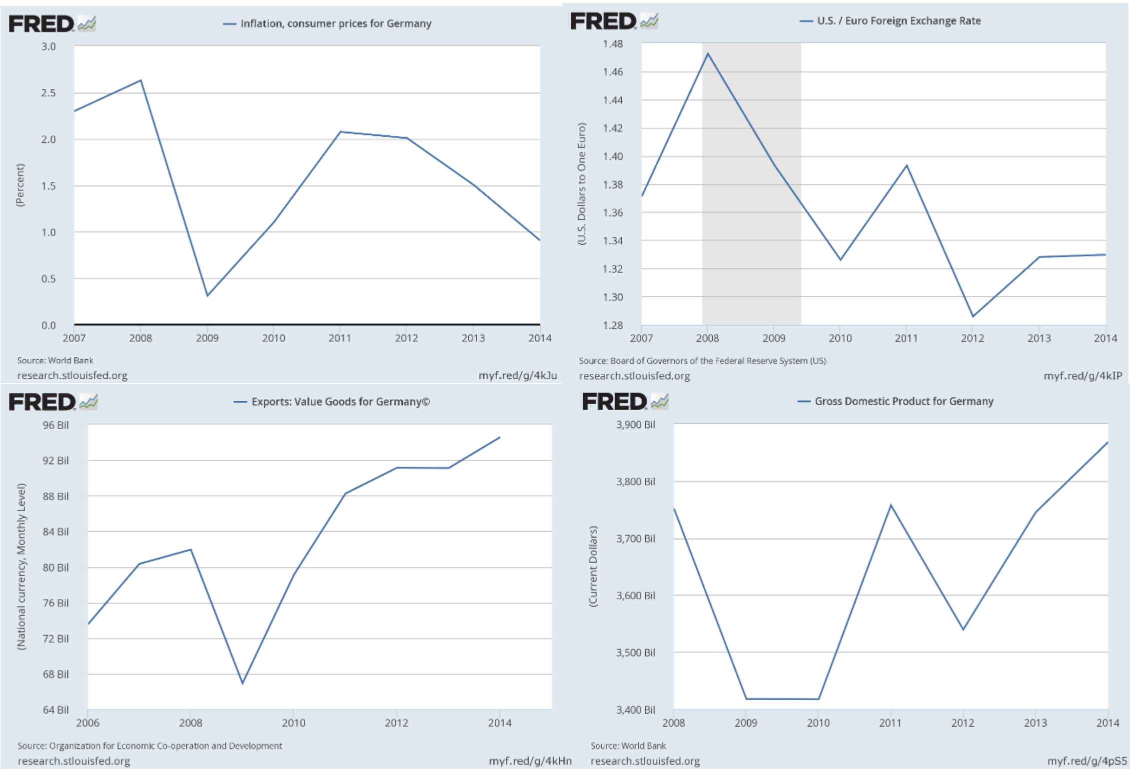
5.3 Germany

Germany is the most important country in the euro zone, is the locomotive of Europe and all eyes are pending for itseconomic health. Germany is the top emitter of euros. The inflation data from Germany is the most important for the ECB.

From 2009 one of the measures taken by the ECB has repeatedly been the reduction of interest rates in order to reactive a damaged economicactivity and improve the financing capacity of families, businesses and even the state, which could finance at more competitive prices. Other factors by which the ECB reduce interest rates were low inflation (Figure 4.4 top-left) and the strong euro (Figure 4.4 top-right) (this strengthenexports punishing).

A determining factor in the low inflation in recent years has been the decline in energy prices. In turn, food prices have increased.

Figure 3.4 Evolution of macro variables in Germany



This figure displays the evolution of several economic indicators in Germany. The top-left plot represents the inflation rate in Germany during the period 2007-2014. The top-right plot shows the US/Euro exchange rate evolution (i.e. how many dollars can be bought with 1 euro). The plot at the bottom-left of the figure displays the total exports of Germany (expressed as the total value of goods in US Dollars).Finally, the plot at the bottom-right presents represents the total GDP (in millions of Dollars) during the period 2007-2014.

The exports after the crisis have been growing year after year (Figure 4.4 bottom-left). That is, the country has benefited from the weak euro as their products has beendone cheaper and more accessible outside the European zone.

It is from 2015 on when the Fed announced a rise in interest rates the US which strengthened the dollar and weakened even more the euro because buying assets in the US currency received higher profitability compared withzero rates in the euro zone. Given that inflation in the Eurozone was at very low levels and also it added the lacking growth in the Eurozone (Figure 4.4 bottom-right)[2], the European Central Bank had not option but to launch its own QE program. The ECB began its boost of liquidity of 1.14 trillion euros - through a program of monthly purchases of debt of 60.00 million- which has led to a depreciation of the European currency at an unprecedented rate (Salobral, 2015).

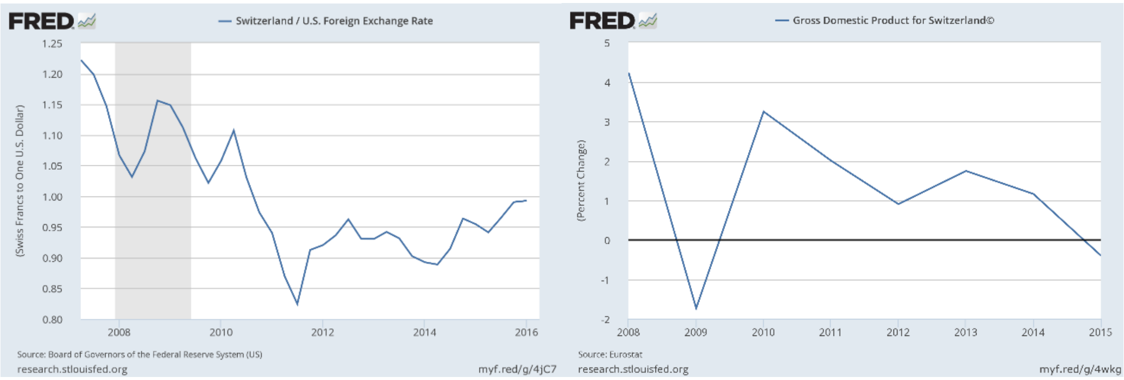
[2] Without real growth GDP since 2011

5.4 Switzerland

Now we talk about a country with an advanced economy. Switzerland is clearly a country dependent on exports which means that a higher value of the franc over the foreign currency means losses for the country and its industries.

Switzerland has remained neutral in last years but this does not benefit the franc because after the financial crisis investors from other countries choose to buy these as a safe method and thus keep Swiss exporters competitive. This caused an increase in the Franc (Figure 4.5 left). At the beginning of 2009 the Swiss currency traded as 1.15 Francs compared to one US dollar.

Figure 3.5 Evolution of macro variables in Switzerland



This figure displays the evolution of several economic indicators in Switzerland. The plot at the left represents the Swiss Franc/Dollar exchange rate evolution (i.e. how many Swiss Francs can be bought with 1 dollar) between 2007 and 2014. The plot at the right of the figure displays the inflation rate in Switzerland during the period 2000-2014.

The SNB controled this by printing more currency, even buying euros (250 billion euros over three years) but this did not work because the Swiss economy began to be too liquid and this caused to have a negative GDP of 2.12% (Figure 4.5 right) and affect the balance of the country.

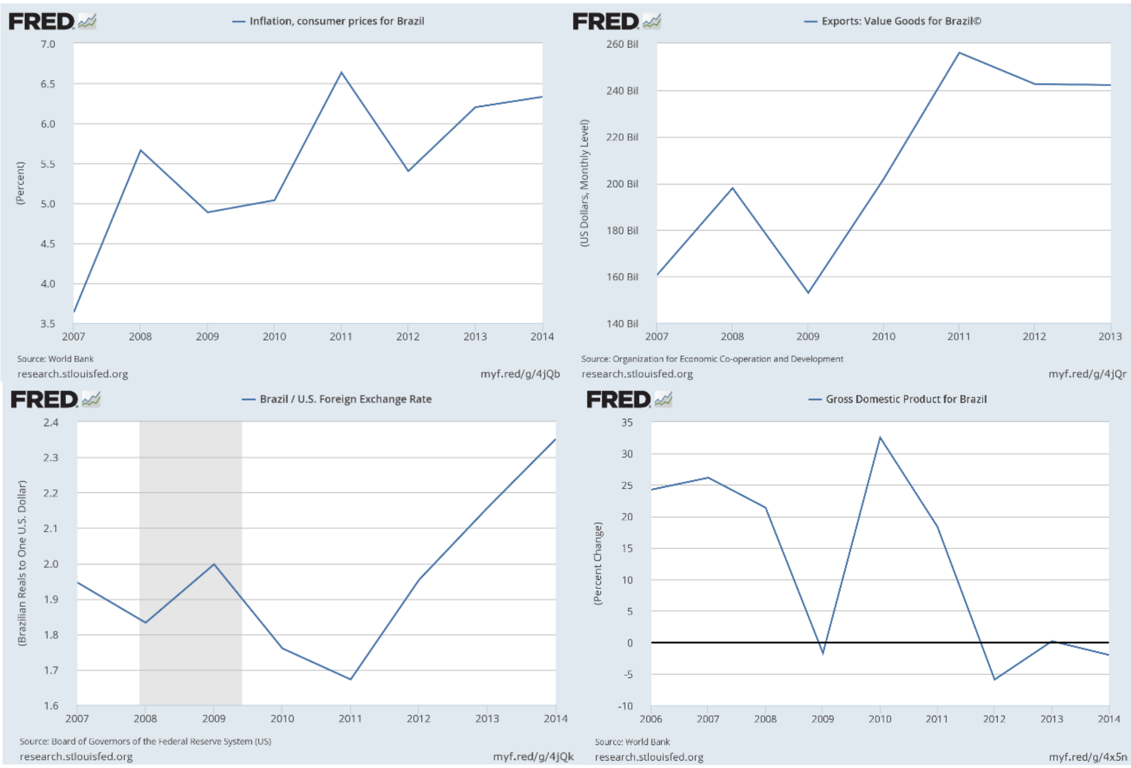
But Switzerland has the advantage that the export destinations are not primarily European countries but countries which can purchase luxury items such as Japan, the US, or Paris. Switzerland has kept its capacity of maneuver and that is what makes independent to the problems of its neighbors.

5.5 Brazil

Brazil is a country still developing but has become the largest economy in Latin America. Since 2003, after a series of structural reforms, an increase in international demand for raw materials and accompanied by the entry of new capital, achieved an economic stability and the most importantthing there were huge reductions of the levels of poverty.

Brazil confronted the economic crisis of 2008 with greater flexibility than many other countries because as we explained previously many investors choseemerging countries to deposit their money and ensure higher returns. The GDP in 2009 fell only 2% over the previous year but in 2010 rose sharply by 33%. It is from 2011 on that Brazil's economy stagnated bringing with it the highest inflation rate (6.6%) in recent years (Figure 4.6 top-left). The rising prices of raw materials made exports go down (Figure 4.6 top-right), the lack of domestic consumption due to indebtedness of household together with a high lack of investment.

Figure 3.6Evolution of macro variables in Brazil



This figure displays the evolution of several economic indicators in Brazil. The top-left plot represents the inflation rate in Brazil during the period 2007-2014. The top-right plot shows the total exports. The plot at the bottom-left of the figure displays the Brazil/US exchange rate evolution (i.e. how many nickels can be bought with 1 dollar) .Finally, the plot at the bottom-right presents represents the total GDP (in percent change) during the period 2007-2014.

More inflation depreciates the value of a currency because it reduces the purchasing power that has anowner of already stated currency upon exchanging money for goods and services in the area corresponding to that currency. This can be seen perfectly in 2011. But in recent years Brazil has continued with high levels of inflation due to the recession in which it is located and its currency experienced an undesirable continuous appreciation reaching nearly 4 nickel per dollar in the last 2015.

5.6 Greece

Greece has been a country that has been spending more than it produced for many years, funding this expenditure through loans (mainly French and German banks). It was believed that in 2001 to adopt the euro would change things but it was not. It was discovered that had been falsifying public accounts, the deficit had was much higher, many scams in pensions and suspected salaries of some civil servant. After the global financial crisis, Greece was limited access to credit, and this did not like to creditor countriesfearful that Greece could fail to make payments or fall into default. It is in 2010 when he was given the first aid to honor its commitments with its creditors. It was not enough and needed a second bailout in 2012 in which he was forced to carry out a series of austerity measures (cuts in public spending, higher taxes and reforms to the pension system and the labor market) leading to many citizens to poverty. Since the first bailout was signed the GDP was falling between 4-8 percent each year (Figure 4.7 bottom-left), aneconomic destruction greater than the US during the Great Depression.

In October-November 2010 inflation was around 5.5 percent annually. In June 2013 inflation was -0.6 percent. Deflation is considered a bad phenomenon for a country's economy due to it discourages investment and consumption and sink more the economy. In 2013 unemployment reached record numbers (27.5%). This five years of rescuers have eliminated more than 1 in 5 jobs.

As notice in Figure 4.7 exports have been growing like in majoritycountries in the Eurozone after the QE. The problem is that they have not grown enough to save the Greece’s economy. Greece has the necessity to achieve strategies to stimulate the exports and compensate the internal and external debt. Greece is unable to enter in this currency war because it cannot adjust its exchange rate to its true competitiveness (competes internationally with some goods and services overpriced because it cannot adjust its currency and that makes it not competitive enough).

One solution that has been proposed to improve the situation of Greece is its exit the Euro. As everything it has good side and bad side. Greece leaving the euro would have to coin another currency, which would probably be the old greek currency, the Drachma. The first negative consequence is easy, Greece would have to spend huge amounts of money on logistics to put back into circulation drachma (replenish all the money from ATMs in drachmas, configuration the machines, issue of the new currency, change all labels, programs of exchange currency, education of the population, etc.). As second consequences the flight massive capital because investors will not want a coin which is to devalue or depreciate. And now it appears the 3rd consequence because if everyone wants to get their money from the bank this would mean the total collapse of the Greek financial system. People will get rid of their drachmas causing it to depreciate even more so as a fourth consequence the Greeks money will be worth very little and therefore they will be even poorer.

However, if the authorities are handling the possibility of a Greek exit to solve the economic problems of the country it is because there could be several positive factors:

1. An increase of exports considering that the value of currency worth less to be, the prices of their products abroad would be cheaper and therefore sell more.

2. An increase of tourism, as obviously, for the rest of the countries would be cheaper to go to Greece on holidays.

Be part of a union makes that the consequences affect each of its parts and therefore a Greek exit from the euro brings different problems for Europe. Because as we know Greece debits a lot of money to European banks and states which would mean the ECB would have to do a recapitalization of its balance sheet, which would be very expensive economically and politically would take many months to put according to all countries of Europe to make a decision. In addition will produce with contagion effect to other countries reach as far as Germany which is the European engine what would produce a strong crash in global economic.

Given the controversial consequences from a potential Greek exit seems very difficult to get a clear answer to solve Greece problems. Political decisions both from Greek and European Parliaments seem to drive Greece to an economic model within the Union. But not having the ability to adjust their currency in the market will surely provoke further disequilibrium in the Greek economy.

Figure 4.7: Evolution of macro variable in Greece

This figure displays the evolution of several economic indicators in the Greece. The top-left plot represents the inflation in percentage during the period 2007-2014. The top-right plot shows the total exports during the period 2007-2014 .The plot at the bottom-left of the figure displays the Gross Domestic Product (expressed of Millions of Euros).Finally, the plot at the bottom-right presents the evolution of the number of unemployed rate between people of 15-64 years old.

5. Conclusion

In a globalized economy, the capital flows move quickly from one economyto other and this can lead to sudden movements in the exchange rate. The central banks take measures in monetary policy to influence mainly on domestic demand, and therefore, the effects on the exchange rate are considered inevitable consequence of this policies, but not an end in itself. Among the economic measures that we have discussed throughout this projectstand out the quantitative easing which are nothing but a boost of liquidity that the central bank entersin the banking system in order to improve the economy of a country mainly benefitingthe banks and exporters without having to notice any improvement in the general population, most likely the opposite.

Moreover, the fact that monetary policy decisions not only impact the economy of the country that adopts them, but its effects are come to feel beyond its borders with the consequent conflict that can generate, this can be considered even as a betrayal between trading partners.

But the consequences of monetary policies do not affect equally to all economies:

In the US case, it withstand this kind of pressure as the dollar is a strong currency with great power worldwide. In fact according to the IMFbetween 60% and 65% of the world reserves are currently saved in dollars.

America is a country that has been allowed to live with large luxury. It is said there has been a tendency to borrowing in order to show more economic power than it actually had. The Federal Reserve through a program of QE reacted getting a decrease of the rate of unemploymentand at the same time it made an increase in the interest rates.Thishelped the American economy grow every day offering better yields than other countries.

The opposite happens in Europe, where in general the economy is weak; the labor market is inflexible, and the ECB keeps low interest rates.

In the Euro zone economic situation is varied (compare the economy of Greece with Germany).

Germany argues that the euro is not devalued for several reasons:

1) Because its high level technology exports are insured.
2) Because it needs to save for paying future pensions and benefits of an aging population given their serious problems in demographic.
3) Because a strong euro gives credibility to investors who finance their public accounts.

The problem is that Germany is not the European Union but has a very important role for the European Central Bank if it were decided to maintain a strong euro, countries like Spain, Italy, Portugal or Greece would have great difficulty.

When we talked about the case of Greece, we have talked aboutthe need to stimulate exports and one of the options could be the return to its national currency: the drachma. If itleaves the euro and regained the control of its monetary policy, it could devalue the drachma and reduce the value of exports and get more expensive the imports. This could give a boost to the domestic production of goods and services.

If Greece will change to a national currency that is valuedless than the euro, thousands of European visitors who frequent the beaches will be cheaper holiday in the Greek islands in the Mediterranean. With that would increase the work for the Greeks in this sector, at a time when almost a quarter of the country is unemployed. The economy will begin to grow and can be able to pay all debts and attract the attention of foreign investors who lost faith in this country.

Another important aspect is that of emerging countries. Quantitative easing of the economies of rich countries and falling interest rates, led to a transfer of money to these countries for higher returns on their investment funds. As was the case in Brazil and Switzerland.

Finally China has imitated the American model to lead the fall in exports. That is why we are seeing the Chinese currency (renminbi or Yuan) depreciate sharply against the dollar.

It makes no difference use the term, currency wars, protectionism, competitive devaluation or depreciation in turn all expressions describe the vicious circle in which we live.

The currency war is a way of get rich impoverishing the neighbor in a continuous dispute of attacks and reprisals. It is a zero-sum game where one gains are necessarily losses for others.

Devaluation is not the final solution because it also has its disadvantages. Leads to reduced standards of living of the citizens, the purchasing power is reduced to when buying imports and when traveling abroad. Also it causes an increase of inflationary pressure. Also it canlead to more expensive interest payments on foreign debt if this is agreed in a foreign currency and, therefore, discourage foreign investors.

However, the devaluation may be temporarily necessary because as we said favors the exports and growth the exports translates directly into a reduction in unemployment as to produce more has needed more workers. Also a rise in price of the imports potencythe consumption of domestic products which again reduce employment. Otherwise if now there are more people employed, they consume more which will increase demand for products and produce more, needing labor again.

But in my opinion these measures must be considered in a balanced manner and with the agreement of the surrounding economies because otherwise the policies of impoverishment neighbors inevitably lead to the logic of an eye for eye, tooth for tooth. And there, we are all losers.

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